

THE AMPHIBIA OF GREER COUNTY, OKLAHOMA¹

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Greer County, Oklahoma, lies not quite in the southwestern corner of the state. It is bounded on the north by Beckham, on the east by Kiowa, on the south by Jackson, and on the west by Harmon counties. It is drained by three major streams: (1) the North Fork of the Red River which separates it from Kiowa County all along its eastern edge, (2) the Elm Fork which cuts diagonally southeastward through its center to enter the North Fork, and (3) the Salt Fork of the Red River which flows eastward and then southward in the southern portions of the county.

Greer is essentially one of the prairie counties of Oklahoma. Probably originally mixed grassland is it now largely short grass prairie. However, in its western and northwestern portions considerable areas of gypsum rock come to the surface and this in some places has caused a rugged relief and a change in vegetation locally as differential erosion has occurred. Similarly, along its eastern border, great granitic masses known as the Granite Mountains occur as largely bare and steep rock up-thrusts from the surrounding plain. These are the western outliers of the Wichita Mountains. In many places in the grassland areas, especially in flat lands along small creeks, smaller or largest stands of mesquite dominate or partially dominate the landscape. Some such stands of mesquite savannah are very extensive like the one in which I once lost my direction and floundered around for an hour or more before wandering onto a section line road running through it and thus finding my way out.

This area of Oklahoma has deficient rainfall, high winds, and high temperatures. The evaporation rate from all water surfaces is very rapid, especially during summer. Fast development is a necessity for any amphibian here that uses temporary pools for breeding, as most of them do. Only one salamander occurs in this region so far as known and no others are expected. The remainder of the Amphibia are Salientia.

1. *Ambystoma tigrinum morvortium* Baird

This "prairie edition" of the tiger salamander is very abundant in all parts of the county. It is a nocturnal, burrowing form whose adults are rarely seen except after rains. Spring and summer rains apparently stimulate breeding—at least, the adults enter the water for breeding at such times only, so far as I can determine. They breed in temporary water (ditches particularly) farther north in western Oklahoma but in Greer County I have found their larvae only in the cattle tanks, some of which here are quite deep (6-12 feet or more) when full. In deep tanks, the larvae will be found only in the deeper (and therefore cooler) water on very hot days.

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In tanks in the gypsum regions, the larvae are very light colored, light cream all over except the tail tip which is intensely black and the gill bars which are bright golden. In waters off the gypsum they are a nondescript greenish-brown; lighter in turbid than in clear water, but never like those on the gypsum.

If one traverse the whole county in June, sampling many tanks, he is struck by the different sized larvae commonly found. In one tank they may be tiny, in another half grown, in still a third intermediate in size. However, within any one region adjacent tanks tend to have larvae of comparable sizes and in a single tank it is rare to find more than two size groups, - usually only one. This phenomenon is associated with rainfall pattern and reflects the dependency of breeding adults upon rainfall for their breeding activities. This is more striking in some years than in others, of course, but so clear cut that during most years one could, by sampling pools for larval sizes, draw a fairly accurate pattern of the rainfall over the county a month or two before. In some years larvae are rare; in others, abundant.

I have not seen their metamorphosis in this region. It sometimes, at least, occurs in July in some other parts of western Oklahoma, north of Greer County.

2. *Acris crepitans* Baird.

Common on muddy banks of pools everywhere, breeding in the adjacent waters. Calling begins usually in April and is intermitant all summer. Most breeding is after the spring rains.

3. *Bufo cognatus* Say.

Very abundant breeding after rains only, in temporary pools.

4. *Bufo compactilis speciosus* Baird.

This is the most abundant toad in this region, breeding after rains in temporary pools, but also in the edges of cattle tanks and in pools along the rivers. This toad and *Bufo cognatus* occur together in all parts of the country. *Bufo compactilis speciosus* tends to be the more abundant on the higher land between stream valleys.

5. *Bufo debelis debelis* Girard.

Following the nomenclature of Sanders and Smith (1951), this is the form to be found here. It is present throughout the county but in small numbers only. It is most abundant on mesquite flats and is unknown immediately near the larger streams. Like the other prairie toads it breeds after rains only and in temporary pools. It must have a very rapid development to exist using so shallow water. That it does so is evidenced also by my consistent misjudging when to return to the site of a breeding congress in an attempt to get its tadpoles, which, until recently, I have been unable to see. I have never seen its eggs which are still undescribed.

6. *Bufo punctatus* Baird and Girard.

This little toad of the rocky and rough regions of Oklahoma is known in Greer County from only one specimen collected in early morning after a rain in the night at the foot of one of the Granite

Mountains. Since it occurs in the prairies in Beckham County to the north (Bragg and Dundee, 1950) and is generally found in gypsum country in western Oklahoma, it presumably occurs sparingly over much of Greer County.

7. *Bufo woodhousei woodhousei* Girard.

This is the abundant toad of lawns and gardens and under streetlights in towns in Greer County. It is also the dominant toad along the streams but it occurs also in prairies and mesquite flats. It is, however, rarer on the higher areas between the streams. It breeds in both temporary and permanent waters and, whereas rain greatly stimulates its breeding, it is not a necessity to it. Mixed breeding congresses of this toad with *Bufo cognatus*, *Bufo compactilis speciosus*, and *Bufo debelis debelis* and members of other genera are the rule rather than the exception after rains in spring and early summer.

8. *Microphyla caroliensis olivacea* (Hallowell).

Abundant everywhere, breeding in rain-formed pools, immediately after rains from late April on through summer. Embryos and tadpoles have a very rapid development but this has not yet been accurately measured.

9. *Pseudacris clarki* Baird.

Very abundant in prairie, breeding in temporary, shallow, well-vegetated pools after rains.

10. *Pseudacris nigrita triseriata* (Wied). (?)

I once found tadpoles in a tank in Greer County which I identified at that time as of this form. Later I ran these down to this subspecies in testing a key (Bragg, 1950) then in preparation. However, I doubt my own record now on ecological grounds and recommend waiting until someone succeeds in finding adults here before definitely placing them in the list of Greer County forms.

11. *Rana catesbeiana* Shaw.

Very common in the larger tanks.

12. *Rana pipiens berlandieri* Baird.

13. *Rana pipiens brachycephala* Cope.

Leopard frogs are very abundant about water everywhere. Some are certainly *R. p. brachycephala*. Further observations are needed in these frogs here as well as elsewhere.

14. *Scaphiopus couchi* Baird.

The southern spadefoot is very abundant in all parts of Greer County. It is common on the roads on summer nights and is sometimes found under streetlights with *Bufo*. It breeds after rains in shallow temporary pools. The exact time relations of its tadpole stages are not known, but I have many indications that the development is very rapid. I have several times failed to find tadpoles two and a half to three weeks after a known breeding congress had produced eggs.

15. *Scaphiopus bombifrons* Cope.

16. *S. hammondi* Baird.

The former of these two is abundant in all parts of Greer County but the latter is rather questionably present. I reported it from tadpoles collected in the gypsum region of the northwestern part of the county (Bragg, 1948), recognizing its tadpoles by the characteristic mouth parts (Smith, 1934; Bragg, 1941). However, Stebbins (1951) has cast doubt on the validity of the beak-notch relationship of the mandibles, having found many intermediate conditions in the western United States. I can confirm him in his facts. In western Oklahoma, including Greer County as well as several others, tadpoles with various intermediate conditions of beak-notch relation have been found. I have known such specimens from the Oklahoma Panhandle for at least twelve years. However, I have always found such specimens within the habitat of *S. bombifrons* when *S. hammondi* were also present: where *S. bombifrons* occurs alone, as in central Oklahoma, none have ever been found with any marked degree of the beak-notch character. Accordingly, I have interpreted the facts to indicate interbreeding between these two in areas where *S. hammondi* is present in small numbers only, the bulk of the population as in Greer County being *S. bombifrons* (Bragg, 1946). The fact that some of the tadpoles studied to the west of Oklahoma may have come from regions where *S. bombifrons* does not occur gives considerable weight to the interpretation of Stebbins as opposed to my own. I do not think the problem settled, however. More observations are needed.

LITERATURE CITED

Bragg, Arthur N.

1941. Tadpoles of *Scaphiopus bombifrons* and *Scaphiopus hammondi*. Wasmann Collector 4: 92-94.

1946. Aggregations with cannibalism in tadpoles of *Scaphiopus bombifrons* with some general remarks on the probable evolutionary significance of such phenomena. Herpetologica 3: 89-97.

1948. Additional instances of social aggregation in tadpoles. Wasmann Collector 7: 65-69.

1950. The identification of Salientia in Oklahoma. Researches on the Amphibia of Oklahoma. Art 1: 9-29, University of Oklahoma Press, Norman.

Bragg, A. N. and Harold Dundee

1950. Salientian Collections in Oklahoma, 1948. Proceedings of the Oklahoma Academy of Science 29: 24-25.

Sanders, Ottys and Hobart M. Smith

1951. Geographic variation in toads of the *dedelis* group of Bufo. Field and Laboratory 19: 141-160.

Smith, Hobart M.

1934. The Amphibians of Kansas. American Midland Naturalist 15: 377-528.

Stebbins, Robert C.

1951. The Amphibia of Western North America. University of California Press, Berkeley. 539 pp.